

LINUX CERTIFICATION OBJECTIVES

This Appendix provides the most current information about the LPI and LCA certification objectives available at this writing. Both the LPI and LCA certification programs require you to take and pass multiple tests as explained in the Preface. To prepare for the LPI tests, you should master the material presented in this book and also in the companion book *Guide to Linux Networking and Security*. To prepare for the first two LCA tests, use this book; to prepare for the third and fourth LCA tests, use the companion book.

LINUX AND GNU EXAM OBJECTIVES

Items in bold text refer to Book II in this series, *Guide to Linux Networking and Security*. Although chapter numbers for material in that book are provided (for example, **Book II, 3**), they are subject to change. Please refer to the Table of Contents and Appendices of *Guide to Linux Networking and Security* for more detailed information. Complete exam objectives are available at www.linuxcertification.com.

Exam 1: Linux Installation and Configuration 3X01-101

Theory of Operation

Objective	Chapter
State the definition, origins, cost, and trade-off of free software.	1
Compare proprietary versus open source software licenses.	1
List the GNU public license (GPL) principles.	1
Describe how to sell free software.	1
Describe the structural components of Linux.	1, 4
Contrast multiuser multitasking versus single-sequential user multitasking.	1
Contrast command-line interpreters versus graphical user interfaces with trade-offs.	4, 6, 7
List PC system architecture configuration issues.	2, 3
Describe hard disk partitioning strategies.	2, 3
Contrast video adapter versus monitor capabilities.	2, 3, 5
List the network configuration parameters.	2, 3

Base System

Objective	Chapter
List and give the trade-off of installation media.	2, 3
Explain the Linux device driver lag and give examples.	2, 3
List the installation steps common to all distributions.	2, 3
Contrast high-volume Linux distributions and give trade-offs.	1, 2, 3
Install four Linux distributions.	1, 2, 3
Describe the configuration tools COAS, Linuxconf, and Yast.	7
List the boot up sequence, log-in, and shut-down sequence.	4
Define "package" and describe how to use it.	4
Describe basic file system principles.	4, 8
Explain the use of mounting versus the use of "mtools" for removable media.	8
List and describe the role of common directories.	4
List and describe the use of basic system navigation programs <code>ps</code> , <code>kill</code> , <code>w</code> , etc.	8, 10
Describe the use and misuse of the superuser account.	3, 8
List the steps in creating a user account.	8
Install, configure, and navigate two X11 window managers.	5

Shells and Commands

Objective	Chapter
Describe shell configuration files.	6
Compare and contrast environmental versus shell variables.	6, 12
Use commands that pass special characters among programs.	7
Use commands that allow programs to communicate.	7
Manipulate files and directories.	4, 6
Use the shell for multitasking.	8
Describe common shell editing commands.	8
Use the following commands in isolation or in combination with each other: <code>ls</code> , <code>cd</code> , <code>more</code> , <code>less</code> , <code>cp</code> , <code>mv</code> , <code>mkdir</code> , <code>rm</code> , <code>rmdir</code> , <code>ln</code> , <code>head</code> , <code>tail</code> , <code>file</code> , <code>grep</code> , <code>du</code> , <code>df</code> , and <code>zcat</code> .	4, 6, 7
Use the following <code>vi</code> commands <code>i</code> , <code>ZZ</code> , <code>:w</code> , <code>:w!</code> , <code>:q!</code> , <code>dd</code> , <code>x</code> , <code>D</code> , <code>J</code> .	6

System Services

Objective	Chapter
List and describe seven tools that provide information on other tools.	1, 7
Describe and use LILO.	2, 3, 4
Install run-time device drivers.	4
Configure a printer capabilities file.	13
Configure a printer filter.	13
Use <code>lpr</code> , <code>lpq</code> , <code>lprm</code> , and <code>lpc</code> to control file printing.	13
List the sections of the X server configuration file.	5
Configure the X server video hardware.	5
Contrast <code>xf86config</code> , <code>XF86Setup</code> , <code>Xconfigurator</code> , and <code>SaX</code> .	5
Describe five components of the X Window System architecture.	5
List and give the trade-offs of Afterstep, KDE, Window Maker, FVWM95, Enlightenment, and Blackbox.	5

Applications

Objective	Chapter
Describe the general control of X11 desktops.	5
Describe Netscape functions, FTP functions, Telnet functions, and mail functions.	3, 5
Contrast WYSIWYG versus mark-up word processing.	6
Contrast ApplixWare, WordPerfect, and StarOffice	Appendix C
Contrast GIMP, X-Fig, and ImageMagick	Appendix C

Troubleshooting

Objective	Chapter
Describe the cause and solution to read errors.	3
Explain why FTP keeps missing certain files in group transfers.	4
Explain the problem and solution when LILO says LI.	4
Define rescue disk and describe three reasons for using it.	9
Explain how to get around a locked-up program.	8, 10
List eight steps to resolve an unresponsive printer.	13
Explain why Linux may report the wrong time and describe how to fix the problem.	2, 3
Describe how to reset the console screen, the keyboard repeat rate, and the Num Lock key.	4, 5
Describe the role of system logging and how to use it for troubleshooting.	11

Exam 2: Linux System Administration

Theory of Operation

Objective	Chapter
Describe the file system structure and hierarchy.	4
Describe the process of file system backup and <code>cron</code> .	12, 14
Describe printing and system tuning.	10, 13
Describe troubleshooting and emergency procedures.	9
List different system resources.	10
Describe the use of user profiles.	8
List different kinds of RAID and describe their uses.	9

Base System

Objective	Chapter
Describe the process of adding and removing a user.	8
List the different run levels and describe how they differ.	4
Describe <code>fstab</code> and volume remounting.	8
Describe the process of recompiling the kernel.	4
Describe performance and hard disk analysis.	8
The student will understand system shutdown techniques.	4

Shells and Commands

Objective	Chapter
Describe the role of the superuser.	2, 3, 4, 6, 7, 8, 9, 10, 12, 14
Describe <code>motd</code> and the issue with it.	4, 6
List and describe the MS-DOS tools.	4, 6
Describe the ARP/Route precedence.	Book II, 1, 2
Describe Bootp and DHCP.	2, 3; Book II, 3, 4
Describe the use of <code>make</code> and <code>touch</code> .	4, 12
Describe the use of CGI scripts.	12
Describe system status, system message logging, and performance analysis.	10, 11

System Services

Objective	Chapter
Describe “user” commands.	4, 6
Describe the archive utilities.	14
Describe using <code>fsck</code> and <code>why</code> .	8
Describe process management.	8
Describe printer settings and restarting.	13
Describe the background line printer daemon and the foreground line printer requester.	13
Describe software packages.	4

Applications

Objective	Chapter
Describe AMANDA, ORL's VNC, Mail Exchange, News, and the Apache Web server.	5, 8, 10
Describe XWindows desktops.	5
Describe benchmarks.	10

Troubleshooting

Objective	Chapter
Describe core dump control.	12

Exam 3: Linux Networking

Theory of Operation

Objective	Chapter
Describe the basic technology of Internet, Ethernet, and area networks.	Book II, 1, 2
Describe addresses and addressing.	Book II, 2
Describe the protocols.	Book II, 1, 2
Describe DNS, applications, and Internet access.	Book II, 5
Describe broadcasting, address assignment, and multicast.	Book II, 1, 2
Describe the UUCP subsystem.	Book II, 2
Describe SMB and IPX.	Book II, 5

Base System

Objective	Chapter
Describe networking interfaces.	2, 3; Book II, 1, 2
Describe the ARP and routing tables.	Book II, 1, 2
Describe firewalls.	Book II, 4, 5
Describe VPN and proxy servers.	Book II, 3, 4, 5
Describe IP multicast.	Book II, 1, 2, 3

Shells and Commands

Objective	Chapter
Describe basic network configuration.	2, 3; Book II, 2, 3
Describe how to access and the importance of system startup files.	4
Describe UUCP.	Book II, 1, 2
Describe network troubleshooting.	Book II, 6

System Services

Objective	Chapter
Describe DNS, FTP, and NFS.	Book II, 3, 4, 5
Describe the internet super server.	Book II, 3, 4, 5
Describe SAMBA.	Book II, 4, 5
Describe <code>sendmail</code> , <code>smail</code> , and <code>qmail</code> .	Book II, 4, 5
Describe POP3 and Imap.	Book II, 4, 5
Describe News, mail list servers, and the Apache server.	Book II, 4, 5

Applications

Objective	Chapter
Describe <code>mail</code> and <code>pine</code> .	Book II, 5
Describe browsers.	Book II, 5

Exam 4: Linux Security, Ethics, and Privacy

Theory of Operation

Objective	Chapter
Describe daemons as superusers and the buffer overflow problem.	Book II, 8, 9
Describe the protection scheme.	Book II, 7, 8, 9
Describe the access control list.	Book II, 8
Describe trojan horses, password weakness, and screening IPs.	Book II, 8
Describe CERT advisories, daily system check, and stealth filenames.	Book II, 7, 8, 9
Describe <code>cert.org</code> and <code>rootshell.com</code> .	Book II, 7
Describe intruder detection and removal.	Book II, 9
Describe user-mode viruses and worms.	Book II, 8, 9
Describe Ken Thompson on trusting trust.	Book II, 7

Base System

Objective	Chapter
Describe setting the superuser status from a shell script.	6; Book II, 8
Describe the importance of classification of user, group, and everybody.	8; Book II, 8
Describe <code>UMASK</code> .	4, 6; Book II, 7
Describe shadow passwords, <code>host.allow</code> , and <code>host.deny</code> .	Book II, 3, 5, 9
Describe the importance of files for logging in as superuser, file transfer as superuser, printer configuration, and system logging.	6, 8, 11, 13

Shells and Commands

Objective	Chapter
Describe the access control list and emulation.	Book II, 8

System Services

Objective	Chapter
Describe <code>checksecurity</code> , <code>rotatelogs</code> , <code>quotaon</code> , <code>quotacheck</code> , and <code>sa</code> .	Book II, 8, 9
Describe pluggable authentication modules.	Book II, 8
Describe TCP/UDP wrappers.	Book II, 1, 2, 9
Describe <code>find</code> , its switches, important commands, and their significance.	4, 6, 7, 14; Book II, 8
Describe the importance of daily cron checks.	12; Book II, 8, 9

Applications

Objective	Chapter
Describe hidden logfile backup.	Book II, 9

Troubleshooting

Objective	Chapter
Describe why <code>setuid</code> shell scripts do not work.	Book II, 8

LINUX PROFESSIONAL INSTITUTE (LPI) EXAM OBJECTIVES

Final objectives for the LPI examinations were not finalized at the time of this writing and may differ somewhat from this list. The material covered is expected to remain consistent, however. The complete objectives are available at www.lpi.org.

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Exam 101: General Linux, Part 1

Topic 1.3 GNU and UNIX Commands

Objective	Chapter
Work effectively on the UNIX command line.	4, 6, 8
Process text streams using text-processing filters.	6
Perform basic file management.	4, 6
Use UNIX streams, pipes, and redirects.	6, 7, 8
Create, monitor, and kill processes.	8, 10
Modify process execution priorities.	10
Perform searches of text files making use of regular expressions.	7, 8

Topic 2.4 Devices, Linux File Systems, File System Hierarchy Standard

Objective	Chapter
Create partitions and file systems.	2, 3
Maintain the integrity of file systems.	8, 9
Control file system mounting and unmounting.	8
Set and view disk quota.	Book II, 3
Use file permissions to control access to files.	4
Manage file ownership.	4
Create and change hard and symbolic links.	4, 6, 9
Find system files and place files in the correct location.	7, 8

Topic 2.6 Boot, Initialization, Shutdown, Run Levels

Objective	Chapter
Boot the system.	3, 4
Change run levels and shut down or reboot the system.	4

Topic 1.8 Documentation

Objective	Chapter
Use and manage local system documentation.	1
Find Linux documentation on the Internet.	1
Write system documentation.	1
Provide user support.	1–14

Topic 2.11 Administrative Tasks

Objective	Chapter
Manage users and group accounts and related system files.	8
Tune the user environment and system environment variables.	6, 8
Configure and use system log files to meet administrative and security needs.	11
Automate system administration tasks by scheduling jobs to run in the future.	12
Maintain an effective data back-up strategy.	14

Exam 102: General Linux, Part 2**Topic 1.1 Hardware and Architecture**

Objective	Chapter
Configure fundamental system hardware.	2, 3
Set up SCSI and NIC devices.	3, 4
Configure modem, sound cards.	2, 3

Topic 2.2 Linux Installation and Package Management

Objective	Chapter
Design hard disk layout.	2, 3, 9
Install a boot manager.	3, 4
Make and install programs from source.	12
Manage shared libraries.	4
Use Debian package management.	Book II, 3
Use Red Hat package manager (rpm).	4

Topic 1.5 Kernel

Objective	Chapter
Manage kernel modules at run time.	4
Reconfigure, build, and install a custom kernel and modules.	4

Topic 1.7 Text Editing, Processing, Printing

Objective	Chapter
Perform basic file editing operations using vi.	6
Manage printers and print queues.	13
Print files.	13
Install and configure local and remote printers.	13

Topic 1.9 Shells, Scripting, Programming, Compiling

Objective	Chapter
Customize and use the shell environment.	6
Customize or write simple scripts.	12

Topic 2.10 X

Objective	Chapter
Install and configure XFree86.	5
Set up XDM.	5
Identify and terminate runaway X applications.	8, 10
Install and customize a window manager environment.	5

Topic 1.12 Networking Fundamentals

Objective	Chapter
Fundamentals of TCP/IP	2; Book II, 1
TCP/IP troubleshooting and configuration	Book II, 1–6
Configure and use PPP	Book II, 3

Topic 1.13 Networking Services

Objective	Chapter
Configure and manage <code>inetd</code> and related services.	Book II, 3
Operate and perform basic configuration of <code>sendmail</code> .	Book II, 5
Operate and perform basic configuration of Apache.	Book II, 5
Properly manage the <code>NFS</code> , <code>smb</code> , and <code>nmb</code> daemons.	Book II, 5
Set up and configure basic DNS services.	Book II, 5

Topic 1.14 Security

Objective	Chapter
Perform security admin tasks.	4, 6, 7, 8, 9, Book II, 7-9
Set up host security.	4, Book II, 7-9
Set up user-level security.	8, Book II, 7-9

